Division of Agricultural Sciences
UNIVERSITY OF CALIFORNIA

NUTRIENT COMPOSITION

OF FRESH CALIFORNIA-GROWN VEGETABLES

By FREDERICK D. HOWARD, JOHN H. MacGILLIVRAY, MASATOSHI YAMAGUCHI

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NUTRIENT COMPOSITION
OF FRESH CALIFORNIA-GROWN VEGETABLES*

F. D. HOWARD • JOHN H. MacGILLIVRAY • M. YAMAGUCHI

THE TABLES in Section I present detailed information on the nutrient composition of fresh vegetables grown in California. In addition to the minerals normally shown in nutrient tables, contents of sodium, potassium, and magnesium are presented. Per cent refuse and household equivalents are also given. Analyses were made on the edible portion, and the value shown represents an average obtained from up to six samplings. The methods used are described on pages 18–19.

Some of the crops in the tables may be considered minor, but are important in the diet of many people. Consumption of these minor crops in the United States amounts to between 25 and 30 pounds per capita, or about 8 per cent of the total vegetable consumption. They provide an opportunity for interesting food variations as well as supplying dietary essentials. Since nutritional values for many of these crops are not generally available, they are incorporated here.

A "Vegetable Description" section, which gives common names and the scientific names according to L. H. Bailey, follows Section I. Where a controversy has arisen concerning the scientific name, the alternative nomenclature is shown with an appropriate reference. This section includes portion analyzed, season available, common edible form, and some miscellaneous information. The numbering agrees with that used to identify the vegetables in the composition tables. French, German, Italian, and Spanish equivalents are listed below the common English name.

A bibliography of food value analyses arranged by countries is given in Section III.

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* Submitted for publication July 17, 1961.

SECTION I.

PROXIMATE COMPOSITION OF VEGETABLES

No.	Vegetable	Refuse A P[a]	Amount per 100-gram fresh edible portion						
			Approximate household equivalent (100 gm = 3½ oz)	Average food energy	Water	Protein	Fat	Total sugar	Othe CHO
		per cent	*units*	*calories*	*grams*				
1	ARTICHOKE, GLOBE..	60	1 small or ½ large	20	83	2.7	0.2	1.8	0.5
	Large bud, 200 gm								
2	Bracts............	60		20	82	2.6	0.1	1.8	0.6
3	Receptacle........	20		20	84	2.8	0.2	1.4	0.6
	Small bud, 100 gm								
4	Bracts............	60		21	83	2.7	0.2	2.2	0.4
5	Receptacle........	30		22	81	2.5	0.3	1.4	0.6
	ASPARAGUS								
6	Green, shoots.....	40	6 5-inch spears ½- to ⅝-inch diameter	27	92	2.8	0.2	1.9	0.3
7	White, shoots.....	30	6 5-inch spears ½- to ⅝-inch diameter	25	93	1.9	0.2	2.3	0.2
	ASPARAGUS BEAN (*See* 15)								
	BEANS								
8	Blackeye pea (Cowpea)........	6	¾ cup	40	85	3.3	0.3	3.0	3.3
9	Fava, immature ..	70	⅔ cup	53	81	5.6	0.6	2.8	3.8
10	Lima, baby.......	60	⅔ cup	90	69	7.1	1.4	3.1	9.2
11	Lima, Fordhook..	60	⅔ cup	80	71	6.3	1.8	2.5	7.5
12	Snap, bush........	6	¾ cup	34	86	2.7	0.2	2.1	3.6
13	Snap, pole........	5	¾ cup	21	91	1.6	0.1	2.3	1.2
14	Soybean..........	40	⅝ cup	106	73	9.0	5.0	2.8	4.1
15	Yard-long........	3	¾ cup	30	89	2.8	0.4	3.1	0.7
16	BEAN SPROUTS (Mung bean)......	0	1⅛ cups	25	92	2.7	0.1	2.1	1.4
17	BEETS, TABLE.......	65	¾ cup, 2 roots, 2-inch diameter	34	89	1.9	0.1	5.9	0.4
	BELL PEPPERS (*See* 82–83)								
18	BORAGE............	20	1⅛ cups	17	93	1.8	0.7	0.9	0.2
	BRASCHETTE (*See* 59)								
19	BROCCOLI, SPROUTING	20	¾ cup or 2½ stalks	23	90	3.6	0.3	1.6	0.4
20	BRUSSELS SPROUTS..	5	5 to 7 sprouts	26	88	3.5	0.2	2.2	0.5
21	BURDOCK ROOT......	10	1 cup	40	72	1.1	(0.1)[d]	1.9	4.8[e]

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[a] As purchased. (Per cent refuse will vary according to quality and method of preparation.)
[b] Carbohydrates.
[c] The carbohydrate fraction of artichoke contains inulin, which is reportedly not metabolized by man and is not includ in these figures.
[d] Estimated value.
[e] Fructosans not included.

Amount per 100-gram fresh edible portion										
Vitamins					Minerals					
A	Thiamine	Riboflavin	Niacin	C	Ca	Fe	Mg	P	K	Na
ternational units	milligrams				milligrams					
160	0.08	0.06	0.8	11	53	1.5	48	78	340	110
220	0.09	0.07	0.7	12	57	2.1	39	70	270	70
100	0.08	0.04	0.8	10	44	1.4	50	80	340	110
220	0.07	0.09	0.8	11	37	1.5	39	75	310	56
100	0.07	0.04	0.7	10	47	1.7	60	83	370	110
980	0.23	0.15	2.2	48	24	1.5	..	52	...	...
50	0.11	0.08	1.1	28	16	1.1	..	52	...	...
634	0.37	0.06	1.3	38	32	1.7	54	78	220	5
350	0.17	0.11	1.5	33	22	1.9	38	95	250	50
390	0.27	0.13	1.6	31	62	3.3	..	175	...	...
250	0.29	0.11	1.4	27	28	2.5	30	145	260	5
540	0.09	0.08	0.9	21	35	1.2	51	78	330	9
450	0.21	0.07	0.6	16	50	0.8	37	41	200	4
640	0.57	0.14	1.6	33	66	2.5	..	178	...	...
1,400	0.13	0.11	1.0	32	50	1.0	51	59	210	4
25	0.11	0.03	0.6	12	20	0.6	16	35	130	2
Trace	0.05	0.02	0.4	11	13	0.5	19	55	290	130
4,200	0.06	0.15	0.9	35	93	3.3	52	53	470	80
3,800	0.11	0.10	0.6	110	78	1.0	39	74	360	40
950	0.13	0.04	0.6	85	39	0.9	23	69	390	30
0	0.01	0.03	0.3	3	41	0.8	..	51	...	...

No.	Vegetable	Refuse A P[a]	Amount per 100-gram fresh edible portion						
			Approximate household equivalent (100 gm = 3½ oz)	Average food energy	Water	Protein	Fat	Total sugar	Othe CHO
		per cent	*units*	*calories*	*grams*				
	CABBAGE								
22	White	15	1½ cups	21	92	1.2	0.1	3.8	0.4
23	Red	15	1½ cups	19	92	1.4	0.1	3.3	0.2
24	Savoy	15	1½ cups	20	91	2.0	0.1	2.9	...
	Chinese								
25	Pak-choi	5	1½ cups	13	95	1.5	0.2	1.0	0.2
26	Pe-tsai	10	1½ cups	11	91	1.2	0.2	1.3	0.1
	CANTALOUPE (*See* 66)								
27	CARDOON	55	1⅛ cups	10	94	0.7	0.1	1.7	0.1
	CARROTS								
28	Chantenay	20	1 cup	31	89	0.8	0.2	6.2	0.4
29	Danvers	25	1 cup	32	87	1.0	0.2	6.6	0.6
30	Imperator	20	1 cup	33	86	1.0	0.2	7.1	0.6
31	Nantes	15	1 cup	32	88	0.8	0.2	6.4	0.4
	CASABA (*See* 67)								
	CAULIFLOWER								
32	Snowball	50	⅔ cup	22	91	2.2	0.1	2.3	0.9
33	Winter	60	⅔ cup	22	90	2.2	0.3	2.5	0.4
34	CELERIAC	55	½ medium, 1 cup	20	88	1.5	0.3	2.0	1.5
	CELERY								
35	Self-blanching	5	¾ cup	7	96	0.7	0.1	1.0	0.2
36	Green	5	¾ cup	8	95	0.9	0.1	1.0	0.2
	CELTUCE								
37	Leaves	20	1¼ cups	12	94	1.1	0.4	1.2	0.1
38	Stalks	70	¾ cup	12	95	0.6	0.2	2.2	0.2
39	CHARD, SWISS, leaves	5	1⅛ cups	16	92	1.8	0.2	1.3	0.2
40	CHAYOTE	0	¾ cup	26	93	0.9	0.3	4.0	1.3
	CHICORY								
41	Leaves	20	½ head	13	92	1.7	0.3	0.9	0.2
42	Roots	0	1 cup	23	80	1.4	0.2	2.4	2.2
	CHILI PEPPERS (*See* 84–85)								
	CHINESE OKRA (*See* 73)								
43	CHIVES	0	¾ bunch	20	92	2.8	0.6	1.0	0.1
	COLLARDS (*See* 58)								
44	CORN, SWEET	65	1 medium ear or ½ cup	116	68	4.0	1.3	3.3	19.0
	COWPEA (*See* 8)								
	CRESS, WATER—(*See* 124)								

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[a] As purchased.
[b] Carbohydrates.
[c] Fructosans not included.

Amount per 100-gram fresh edible portion										
Vitamins					Minerals					
A	Thiamine	Riboflavin	Niacin	C	Ca	Fe	Mg	P	K	Na
ernational units	*milligrams*				*milligrams*					
200	0.05	0.03	0.3	60	38	0.4	22	34	220	20
40	0.05	0.03	0.3	57	51	0.7	17	42	190	17
1,000	0.07	0.03	0.3	31	35	0.4	28	42	230	28
3,000	0.04	0.07	0.5	45	105	0.8	27	37	180	100
1,200	0.04	0.05	0.4	27	92	0.5	14	31	230	70
120	0.02	0.03	0.3	2	70	0.7	42	23	400	170
13,000	0.05	0.04	0.3	6	30	1.4	17	36	250	70
15,000	0.05	0.04	0.4	6	33	1.1	..	40	...	...
14,000	0.05	0.04	0.5	7	39	1.3	17	43	280	34
10,000	0.05	0.03	0.4	5	31	0.9	..	32	...	...
40	0.09	0.02	0.6	71	30	0.5	12	45	230	20
0	0.08	0.06	0.6	72	35	0.6	19	60	340	20
0	0.05	0.06	0.7	8	43	0.7	20	115	300	100
90	0.03	0.02	0.3	7	25	0.3	10	27	160	200
120	0.03	0.04	0.3	10	70	0.5	14	34	240	130
3,500	0.09	0.12	0.5	33	59	0.8	38	34	330	9
70	0.02	0.02	0.6	6	18	0.3	17	43	330	12
3,300	0.04	0.09	0.4	30	51	1.8	75	46	240	250
50	0.03	0.04	0.5	11	19	0.4	14	20	150	4
4,000	0.06	0.10	0.5	24	100	0.9	30	47	420	45
0	0.04	0.03	0.4	5	41	0.8	22	61	290	50
6,400	0.10	0.18	0.7	79	81	1.6	55	51	250	6
,650	0.20	0.06	1.7	9	11	1.4	45	125	260	10

No.	Vegetable	Refuse A P[a]	Amount per 100-gram fresh edible portion						
			Approximate household equivalent (100 gm = 3½ oz)	Average food energy	Water	Protein	Fat	Total sugar	Other CHO[b]
		per cent	units	calories	grams				
	CUCUMBER								
45	Marketing	15	¾ cup	12	96	0.6	0.1	2.5	0.2
46	Pickling	0	¾ cup	12	96	0.7	0.1	2.0	0.2
	DASHEEN (*See* 115–116)								
	DOCK (*See* 98)								
	EDIBLE PODDED PEA (*See* 80)								
47	EGGPLANT	10	1 slice, ¾ x 4 inches or 1½ cups	20	93	1.1	0.1	3.3	0.7
48	ENDIVE	20	½ head	11	95	1.3	0.2	1.1	0.1
49	EPOS ROOT (dry)	. .	1 cup	154	60	4.6	1.8	9.3	21.5
50	ESCAROLE	15	1¼ cups or ¼ head	12	94	1.2	0.2	1.4	0.1
	FAVA BEAN (*See* 9)								
51	FLORENCE FENNEL (Sweet anise)	60	2 cups	15	93	1.1	0.1	2.3	0.3
52	GARLIC, bulbs	20	2 of 2-inch diameter	39	61	6.4	0.5	1.0	1.9[c]
53	GHERKIN	0	6 fruits	17	93	1.4	0.3	2.2	0.4
54	GINGER	30	¾ cup	28	90	1.5	0.7	2.8	2.3
	GUMBO (*See* 72)								
	HONEYDEW (*See* 68)								
55	HORSE-RADISH	0	¾ cup	55	77	3.1	1.7	1.8	5.2
56	HUSK-TOMATO	2	1 cup	25	91	1.4	0.5	3.9	0.3
57	ICE-PLANT	0	1¼ cups	5	94	0.7	0.2	0.1	0.2
58	KALE	25	1½ cups	27	85	3.3	0.7	2.0	0.4
59	Kale, Scotch (Braschette)	40	1½ cups	26	87	2.8	0.6	2.3	0.2
60	KOHLRABI	40	¾ cup	23	91	1.7	0.1	4.5	0.1
61	LEEK	70	1 cup, 3 to 5 of 1-inch diameter	35	83	1.5	0.3	4.5	0.9
	LETTUCE								
62	Butterhead	20	⅓ to ½ head	11	96	1.2	0.2	1.1	0.1
63	Cos (Romaine)	25	¼ head	16	94	1.6	0.2	2.0	0.1
64	Crisphead (Great Lakes)	15	¼ head	11	95	0.8	0.1	2.2	0.1
	LIMA BEAN (*See* 10–11)								
65	LOTUS ROOT	5	1¼ cups	69	75	2.6	0.1	1.2	13.5

[a] As purchased.
[b] Carbohydrates.
[c] Fructosans not included.

F VEGETABLES

Amount per 100-gram fresh edible portion										
Vitamins					Minerals					
A	Thiamine	Riboflavin	Niacin	C	Ca	Fe	Mg	P	K	Na
ternational units	*milligrams*				*milligrams*					
45	0.03	0.02	0.3	12	12	0.3	15	24	150	6
270	0.04	0.02	0.4	19	13	0.4	14	24	190	6
70	0.09	0.02	0.6	7	7	0.4	16	25	210	5
2,500	0.07	0.08	0.4	8	42	2.0	20	30	280	60
0	0.11	0.12	3.0	13	110	6.5	32	165	340	12
1,600	0.09	0.07	0.4	5	50	0.7	14	21	240	72
100	0.04	0.02	0.4	9	44	0.8	23	38	330	90
0	0.20	0.11	0.7	15	24	1.7	32	195	540	10
270	0.10	0.04	0.4	51	26	0.6	32	38	290	6
0	0.02	0.02	0.6	5	22	0.3	. .	13	. . .	. . .
0	0.06	0.03	0.5	95	150	2.4	81	41	420	16
380	0.15	0.03	3.5	4	8	0.3	. .	34	. . .	. . .
2,000	0.04	0.06	0.3	23	20	0.6	. .	26	. . .	. . .
5,800	0.11	0.13	1.0	120	135	1.7	34	56	400	40
3,100	0.07	0.06	1.3	130	205	3.0	88	62	450	70
30	0.05	0.02	0.4	62	24	0.4	19	46	350	20
95	0.06	0.03	0.4	12	59	2.1	28	35	180	20
1,200	0.07	0.07	0.4	9	40	1.1	16	31	270	10
2,600	0.10	0.10	0.5	24	36	1.1	6	45	400	9
300	0.07	0.03	0.3	5	13	1.5	7	25	100	5
0	0.16	0.22	0.4	44	45	1.6	25	100	730	40

No.	Vegetable	Refuse A P[a]	Amount per 100-gram fresh edible portion						
			Approximate household equivalent (100 gm = 3½ oz)	Average food energy	Water	Protein	Fat	Total sugar	Other CHO[b]
		per cent	*units*	*calories*	*grams*				
	MELONS								
66	Cantaloupe (muskmelon)	45	⅛ of 6-inch melon	31	90	1.0	0.1	7.0	0.2
67	Casaba	45	1-inch wedge from 8-inch melon	26	92	0.6	0.1	6.2	0.1
68	Honeydew	45	½ slice, ¾ x 10 inches	41	87	0.9	0.1	10.1	0.2
69	Watermelon	50	6 1-inch cubes	36	90	0.6	0.1	9.0	0.1
	MUNG BEAN SPROUTS (*See* 16)								
70	MUSHROOM	0	2 cups	13	92	2.9	0.1	0.1	0.3
71	MUSTARD GREENS	5	2 cups	15	91	2.7	0.2	0.8	0.1
	NEW ZEALAND SPINACH (*See* 100)								
72	OKRA (Gumbo)	10	10 to 12 pods	25	88	2.0	0.1	2.5	0.2
73	OKRA, CHINESE	10	2 medium fruits	20	93	1.2	0.2	3.2	0.8
	ONION, DRY, bulbs								
74	Southport White Globe	5	1 medium or 1 cup	37	86	1.5	0.6	8.1	0.3[e]
75	Sweet Spanish	5	1 medium or 1 cup	26	90	0.5	0.1	6.3	0.2[e]
	ONION, GREEN								
76	Bulb	10	1 cup	21	90	1.3	0.2	3.5	0.5[e]
77	Leaves		2 cups	19	92	2.0	0.2	3.0	0.4
78	PARSLEY	5	2½ cups or 1 small bunch	16	90	2.2	0.3	1.1	0.2
79	PARSNIP	15	¾ cup	53	81	1.2	0.3	4.8	6.8
	PEAR TOMATO (*See* 118)								
	PEAS								
80	Edible (podded)	5	¾ cup	35	88	2.8	0.2	4.0	1.8
81	Garden (green)	70	¾ cup	68	79	5.9	0.3	5.6	5.4
	PEPPERS								
82	Bell (green)	15	1 of 4-inch fruit, 1 cup	22	93	0.9	0.3	4.0	0.4
83	Bell (red)	15	1 of 4-inch fruit, 1 cup	29	91	0.8	0.6	5.0	0.3
84	Chili (green)	5	1 medium	43	86	2.0	1.5	5.1	0.8
85	Chili (red)	5	1 medium	46	84	2.0	2.0	5.5	0.3
86	Pimiento	30	1 large	35	90	1.2	0.9	5.6	0.3

[a] As purchased.
[b] Carbohydrates.
[e] Fructosans not included.

Amount per 100-gram fresh edible portion										
Vitamins					Minerals					
A	Thiamine	Riboflavin	Niacin	C	Ca	Fe	Mg	P	K	Na
ternational units	*milligrams*				*milligrams*					
4,200	0.06	0.02	0.9	45	10	0.4	17	39	330	20
Trace	0.06	0.02	0.4	19	5	0.4	8	7	210	12
500	0.06	0.02	0.6	32	6	0.2	10	14	330	20
300	0.08	0.02	0.2	6	5	0.2	11	9	130	5
0	0.08	0.30	4.6	8	5	0.5	12	90	320	9
5,300	0.08	0.11	0.8	70	140	2.0	48	45	340	50
660	0.20	0.06	1.0	44	81	0.8	59	63	280	10
410	0.05	0.06	0.4	12	20	0.4	..	32	...	...
0	0.06	0.01	0.1	9	33	0.4	17	43	180	8
0	0.02	0.02	0.1	6	27	0.6	16	27	120	6
330	0.06	0.05	0.3	32	62	0.5	25	43	120	70
5,000	0.07	0.14	0.2	45	80	1.0	24	30	220	10
5,200	0.08	0.11	0.7	90	125	2.0	79	40	270	140
0	0.09	0.05	0.7	17	40	0.7	29	69	330	10
580	0.15	0.08	0.6	60	43	0.9	22	53	170	6
1,000	0.30	0.08	1.5	40	35	1.6	31	110	260	10
530	0.06	0.02	0.4	160	7	0.4	13	22	150	2
5,700	0.11	0.08	0.7	220	4	0.3	13	28	200	2
10,500	0.08	0.08	0.9	245	17	1.4	23	46	260	5
11,000	0.10	0.10	1.0	240	18	1.0	27	45	420	9
2,200	0.05	0.46	0.6	165	9	0.5	4	20	250	4

No.	Vegetable	Refuse A P[a]	Amount per 100-gram fresh edible portion						
			Approximate household equivalent (100 gm = 3½ oz)	Average food energy	Water	Protein	Fat	Total sugar	Other CHO
		per cent	units	calories	grams				
	POTATO								
87	Pontiac	5	¾ cup	75	78	2.3	0.1	0.7	15.6
88	Russet Burbank	5	¾ cup	71	80	2.1	0.1	0.7	14.9
89	White Rose	5	¾ cup	72	80	2.0	0.1	1.0	15.0
	PUMPKIN (*See* 107–111)								
	RADISH								
90	Chinese winter	50	1 cup	13	94	0.6	0.1	2.5	0.2
91	Icicle	35	1 of 1-inch diameter	15	94	1.1	0.1	2.5	0.1
92	Scarlet Globe	40	4 to 6 of 1-inch diameter	14	94	0.7	0.1	2.7	0.1
	RAPPINI (*See* 121)								
93	RHUBARB	20	¾ cup, 2 9-inch stalks	12	92	0.7	0.2	2.0	0.3
94	RUTABAGA	40	¾ cup	25	90	1.2	0.2	5.0	0.5
95	SALSIFY (Vegetable oyster)	25	¾ cup or 2 medium	34	77	3.3	0.2	2.9	2.3
	SCOTCH KALE (*See* 59)								
	SEA-KALE								
96	Blanched	0	1½ cups	13	94	2.0	0.3	0.7	0.1
97	Green	0	1½ cups	22	90	3.5	0.3	1.2	0.1
	SNAP BEAN (*See* 12–13)								
98	SORREL (Dock)	25	¾ cup	15	93	2.0	0.7	0.3	0.2
	SOYBEAN (*See* 14)								
99	SPINACH	5	1½ cups	20	90	3.6	0.4	0.6	0.2
100	SPINACH, NEW ZEALAND	0	1½ cups	10	94	1.5	0.2	0.4	0.2
	SQUASH (SUMMER)								
101	Crookneck	3	¾ cup	22	92	1.4	0.2	2.6	1.3
102	Early Prolific	2	¾ cup	16	94	1.0	0.2	2.4	0.6
103	Scallop	1	¾ cup	18	93	1.2	0.2	2.5	0.8
104	Zucchini	5	¾ cup	13	95	1.2	0.1	1.8	0.2
105	Balsam Pear	25	¾ cup	10	94	1.1	0.2	0.8	0.4
106	Chinese squash	10	¾ cup	18	94	1.0	0.2	2.3	1.0
	SQUASH (WINTER) AND PUMPKIN								
107	Acorn, Table Queen	40	¾ cup	35	86	0.8	0.1	7.0	1.0
108	Pink Banana	15	¾ cup	20	91	2.0	0.2	3.0	0.3
109	Butternut	25	¾ cup	41	85	1.0	0.1	4.5	4.0
110	Hubbard	35	¾ cup	34	88	2.0	0.5	5.0	1.3
111	Chinese winter-melon	25	Slice, 1 x 5 inches	9	96	0.2	0.1	1.9	0.2

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[a] As purchased.

[b] Carbohydrates.

Amount per 100-gram fresh edible portion										
Vitamins					Minerals					
A	Thiamine	Riboflavin	Niacin	C	Ca	Fe	Mg	P	K	Na
ernational units	*milligrams*				*milligrams*					
0	0.13	0.02	0.3	10	9	0.7	30	65	390	6
0	0.10	0.01	0.6	6	10	0.7	26	38	340	12
0	0.09	0.02	0.6	36	19	1.3	20	51	370	9
0	0.02	0.02	0.2	22	27	0.4	22	24	190	30
0	0.03	0.02	0.3	29	27	0.8	9	28	280	16
0	0.02	0.03	0.4	21	20	0.8	11	27	190	30
100	0.02	0.03	0.3	8	130	0.7	28	20	360	10
Trace	0.09	0.04	0.7	33	31	0.4	19	41	220	20
0	0.08	0.22	0.5	8	60	0.7	23	75	380	20
100	0.04	0.04	0.3	26	35	0.5	..	34	...	...
4,600	0.16	0.10	0.5	87	110	0.9	64	63	360	30
4,000	0.04	0.10	0.5	48	44	2.4	103	63	390	4
5,800	0.12	0.16	0.8	52	107	2.1	103	66	710	110
4,400	0.04	0.13	0.5	30	58	0.8	39	28	130	130
140	0.07	0.04	0.6	18	19	0.5	26	38	190	3
80	0.05	0.03	0.5	19	19	0.4	20	28	180	3
110	0.07	0.03	0.6	18	19	0.4	23	36	150	3
340	0.07	0.03	0.4	9	15	0.5	21	32	220	3
380	0.04	0.04	0.4	84	19	0.5	..	28	...	...
450	0.02	0.04	0.5	57	13	0.4	..	23	...	...
340	0.14	0.01	0.7	11	33	0.7	32	36	520	6
2,700	0.08	0.04	0.8	6	27	0.5	16	38	330	3
7,800	0.10	0.02	1.2	21	48	0.7	34	33	400	...
5,400	0.07	0.04	0.5	11	14	0.4	19	21	320	7
Trace	0.02	0.03	0.5	14	14	0.4	16	7	200	2

No.	Vegetable	Refuse A P[a]	Amount per 100-gram fresh edible portion						
			Approximate household equivalent (100 gm = 3½ oz)	Average food energy	Water	Protein	Fat	Total sugar	Other CHO[b]
		per cent	*units*	*calories*	*grams*				
	Sweet Anise (*See* 51)								
	Sweet Potato								
112	Jersey	15	¾ cup	116	67	2.0	0.2	6.0	21.0
113	Puerto (Porto) Rico	15	¾ cup	101	70	2.0	0.2	4.4	[illegible]
114	Velvet	15	¾ cup	93	69	1.4	0.2	5.8	16.3
	Swiss Chard (*See* 39)								
	Taro (Dasheen)								
115	Pink	15	¾ cup	52	80	1.0	0.2	0.7	11.0
116	White	15	¾ cup	54	82	2.0	0.2	1.0	10.0
	Tomato								
117	Pearson	5	1 of 3-inch diameter	19	94	0.9	0.1	3.5	0.2
118	San Marzano (Pear tomato)	5	1 medium	15	94	0.9	0.1	3.0	0.5
	Tomato, Husk—(*See* 56)								
	Turnip								
119	Greens	10	2 cups	14	91	1.5	0.3	1.3	0.1
120	Roots (mature)	55	¾ cup	18	92	0.9	0.1	3.8	0.2
121	Tops and roots (immature) (Rappini)	20	2 to 4 plants	18	92	1.8	0.2	1.7	0.2
	Vegetable Oyster (*See* 95)								
122	Water-Chestnut	35	15 to 20 corms	56	82	1.4	0.1	4.8	8.0
123	Water-Convolvulus	0	1½ cups	25	92	2.6	0.2	0.3	3.1
124	Water-Cress	0	2½ cups	11	95	2.3	0.1	0.2	0.2
	Watermelon (*See* 69)								
125	Wonderberry	0	1 cup	24	89	2.0	1.0	1.0	0.1
126	Yam	20	¾ cup	88	74	1.8	0.5	0.5	19.0
	Yard-Long Bean (*See* 15)								

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[a] As purchased.
[b] Carbohydrates.

Amount per 100-gram fresh edible portion										
Vitamins					Minerals					
A	Thiamine	Riboflavin	Niacin	C	Ca	Fe	Mg	P	K	Na
ternational units	milligrams				milligrams					
1,500	0.10	0.02	0.8	32	60	0.9	34	57	390	40
8,800	0.20	0.03	0.5	18	36	0.9	30	71	430	60
14,000	0.10	0.04	0.2	21	37	0.7	28	65	290	80
0	0.10	0.03	0.6	5	60	0.7	46	107	560	4
0	0.09	0.02	0.6	4	26	0.4	25	60	710	7
1,700	0.10	0.02	0.6	21	6	0.3	10	16	220	5
770	0.10	0.01	0.7	23	9	0.1	11	20	250	3
3,400	0.07	0.10	0.6	60	190	1.1	31	42	250	40
0	0.04	0.03	0.4	21	30	0.3	11	27	170	40
2,700	0.05	0.07	0.5	70	125	1.5	45	45	250	40
0	0.14	0.20	1.0	10	11	3.5	12	63	500	20
3,500	0.03	0.10	0.9	55	95	2.2	49	40	370	6
4,700	0.09	0.12	0.2	43	120	0.2	13	60	270	32
570	0.10	0.06	0.7	12	24	0.6	40	42	510	2
0	0.08	0.01	0.4	6	23	0.6	29	65	600	14

METHODS USED

All analyses given in the preceding tables were performed on freshly harvested materials in the chemical laboratories of the Department of Vegetable Crops, University of California, Davis. Vegetables were either grown at the Experiment Station at Davis, California, or obtained directly from farmers or wholesale markets. Transported vegetables were packed in ice and prepared for analysis within two hours following arrival. Ten to 15 of the larger vegetables, each from different plants where possible, were used in a sample. When smaller vegetables were used, individuals from 20 or more plants made up the sample.

Prior to sampling, the vegetables were trimmed. (The trimmings are listed as per cent refuse.) Approximately one to two kilograms of chopped tissue representative of a given lot were selected for sampling. For vitamin analyses, aliquots were stabilized as rapidly as possible to avoid losses. Another portion was preserved in boiling 95 per cent alcohol for total sugar and starch analyses. Additional aliquots were dried for water, protein, fat, and mineral determinations.

Each compositional value was derived from the mean of duplicate analyses. Agreement between duplicates was within 5 per cent. Where two or more samplings were performed, the means were averaged.

Food energy: Food energy was calculated from contents of total sugars and other carbohydrates, fats, and proteins according to Sherman's formula (Sherman, 1952).

Water: Water content was taken as the difference between fresh weight and dry weight where the dry weight was obtained by drying 100 grams of chopped sample in a forced-draft oven at 65° to 70° C for 36 to 48 hours.

Protein, calcium, phosphorus, and iron: These were determined by official methods (Association of Official Agricultural Chemists, 1955). Aminonaphthol sulfonic acid was substituted for hydroquinone as the reducing agent in the determination of phosphorus.

Crude fat: Crude fat was determined by extracting two grams of dry ground sample with ethyl ether in a Soxlet apparatus until the weight of the residue was constant (approximately 16 hours). The loss in weight was taken as crude fat.

Sugars and other carbohydrates: Total sugars and other carbohydrates, including starch, were determined by the official methods (Association of Official Agricultural Chemists, 1955). Alcohol-insoluble carbohydrates were determined on the residue from the 80 per cent alcohol extract, using diastase for digestion instead of malt extract.

Vitamin A: Vitamin A values were calculated from carotene determinations, where 0.6 microgram of beta carotene or 1.2 micrograms of alpha carotene equal one International Unit. Carotene was determined by the method given in *Methods of Vitamin Assay* (Association of Vitamin Chemists, 1947). The sample was extracted in alcoholic KOH and petroleum ether in a Waring blender. Chromatographic analysis was used.

Thiamine and riboflavin: Thiamine and riboflavin were determined photofluorometrically (Association of Vitamin Chemists, 1947).

Niacin: The clarase-digested extract prepared for the thiamine and riboflavin procedures was stored under toluene at 32° F until analyzed for niacin. A microbiological method (Association of Official Agricultural Chemists, 1955), modified by using enzyme-hydrolyzed casein in the basal medium, was used.

Ascorbic acid: Ascorbic acid was determined by the method of Loeffler and Ponting (1942). Dehydro-ascorbic acid, which was reduced to ascorbic acid by H_2S, was included.

Sodium, potassium, and magnesium: These were determined on solutions prepared from dried, ashed plant material, using a Beckman Model DU flame spectrophotometer modified with a special photomultiplier attachment as described by Brown *et al.* (1952).

DISCUSSION

Many factors influence plant composition and hence nutrient value. Some general considerations may be genetic constitution, soil and climate, age or maturity at time of harvest, and method of handling between harvest and use. An excellent review of the literature stressing environmental influences on chemical composition of plants was published in 1954 (Southern Cooperative Series Bulletin No. 36). In 1951 a critical evaluation of sampling techniques and chemical analyses was published (Southern Cooperative Series Bulletin No. 10). It is important to bear these in mind in interpreting nutritive value data.

Because of genetic differences, the nutrient composition of some of the more common cultivars is listed for comparison. For the major crops, where more than two analyses were made, samples were obtained from several growing areas and generally during the season of peak production. In this way some attention was given to variables related to soil and climate, though they were not pinpointed. Sample selection was made when the vegetables were considered to be at optimal market stage. For items obtained in the wholesale markets, the time lapse between harvest and sampling was, in general, less than 24 hours. Vegetables grown on the Experiment Station were sampled within 2 hours following harvest.

Because the above-mentioned factors influence nutrient composition variably, when the table is used the figures should not be interpreted in an absolute sense but rather as indicative of an order of magnitude which can be expected.

LITERATURE CITED

IN DISCUSSION OF METHODS

Association of Official Agricultural Chemists

1955. Official and tentative methods of analysis of the Association of Official Agricultural Chemists. 8th ed. Washington, D.C. 1008 p.

Association of Vitamin Chemists, Inc.

1947. Methods of vitamin assay. Interscience Publishers, Inc., New York. 189 p.

Brown, J. G., C. G. Patten, M. E. Gardener, and R. K. Jackson

1952. A line operated photomultiplier unit for measuring spectral emissions in flame analysis. Am. Soc. Hort. Sci. Proc. **59**:337–342.

Loeffler, H. J., and J. D. Ponting

1942. Ascorbic acid. Rapid determination in fresh, frozen, or dehydrated fruits and vegetables. Industrial Eng. Chem., Analytical Ed., **14**:846–849.

Sherman, H. C.

1952. Chemistry of food and nutrition. 8th ed. The Macmillan Co., New York. 721 p.

Southern Cooperative Series Bull. No. 10

1951. Publ. by North Carolina, Georgia, Oklahoma, Texas, Arkansas, Louisiana, Mississippi, and Puerto Rico Agr. Expt. Stations. 143 p.

Southern Cooperative Series Bull. No. 36

1954. Publ. by North Carolina, Georgia, Oklahoma, Texas, Mississippi, and Puerto Rico Agr. Expt. Stations. 198 p.

SECTION II.

VEGETABLE DESCRIPTIONS AND NOTES

VEGETABLE DESCRIPTIONS AND NOTES‡

Name or cultivar*	Other names	Scientific name	Family	Edible portion analyzed	Season available†	Common edible form	Miscellaneous information
1–5 Artichoke Artichaut Artischoke Carciofo Alcachofa	"Chokes"	*Cynara scolymus* L.	Compositae (Sunflower)	Base of inflorescence, bracts, and receptacles	*Spring* Summer Fall Winter	Cooked Canned Frozen Pickled	Mature plants yield 40–50 buds per season. Green, purple, white, and red varieties are known. Contains the carbohydrate inulin, reported to be unavailable as an energy source for man.
6–7 Asparagus Asperge Spargel Asparago Espárrago	"Grass"	*Asparagus officinalis* L. var. *altilis* L.	Liliaceae (Lily)	Young tender shoots	Fall Late winter *Spring*	Cooked Canned Frozen	To obtain white asparagus, crowns are ridged with soil and spears cut as they emerge.
8 Blackeye pea	Cowpea Southern pea Table pea	*Vigna sinensis* Savi	Leguminosae (Pea or Pulse)	Immature pods	Spring Summer Fall	Cooked Dried Frozen	Botanically closer to beans than peas. An important soil-improving crop. Mature seeds also edible.
9 Fava bean Fève, Gourgane Garten-Bohne Fava Haba	Broad bean Horse bean English bean European bean Windsor bean	*Vicia faba* L.	Leguminosae (Pea or Pulse)	Immature seeds	Spring Summer	Cooked Dried	One of the oldest of cultivated beans; often used as a cover crop. Immature pods also edible.
10–11 Lima bean Haricot de Lima Breitschotige Lima Bohne Fagiuolo di Lima Judia (de Lima)	Baby lima Sieva Potato bean Large-seeded Carolina lima Butter bean	*Phaseolus lunatus* L. (*P. limensis* Macf.)	Leguminosae (Pea or Pulse)	Immature seeds	Summer Fall	Cooked Canned Frozen Dried	Of American origin. Harvested when immature for fresh or frozen purposes; dried beans harvested when mature.
12–13 SNAP BEAN Haricot Bohne Fagiolino Habichuelas	String bean Kidney bean French bean		Leguminosae (Pea or Pulse)				Native to South America. Dry mature seeds an excellent source of protein.

12 Snap bean, bush	Bush bean	*Phaseolus vulgaris* L. var. *humilis* Alef.		Immature pods	Late spring *Summer* Fall	Cooked Canned Frozen	Known for its nonclimbing habit.
13 Snap bean, pole	Pole bean	*Phaseolus vulgaris* L.		Immature pods	Late spring *Summer* Fall	Cooked Canned Frozen	
14 Soybean Soja Soja-Bohne Soia Soja	Soja bean Soya bean	*Glycine max* Merr.	Leguminosae (Pea or Pulse)	Immature seeds	Summer Fall	Cooked Dried	World's most important bean. Major source of food and oil in Orient for thousands of years. Used in many products, including soy sauce.
15 Yard-long bean Dolique *or* haricot asperge Amerikanische Riesen-Spargel-Bohne ——— ———	Asparagus bean Dolichos bean	*Vigna sinensis* Savi subsp. *sesquipedalis* Van Es. (9) (*V. sequipedalis* Fruwirth)	Leguminosae (Pea or Pulse)	Immature pods	Summer Fall	Cooked	Pods 1 to 3 feet long; similar in eating quality to snap beans.
16 Bean sprouts	Mung bean sprouts	*Phaseolus aureus* Roxb.	Leguminosae (Pea or Pulse)	Germinated sprouts with radicle 2 to 3 inches long	Spring Summer Fall Winter	Cooked Canned	Used chiefly in Oriental dishes.
17 Beet, table Betterave, bette Rübe, Rote Barbabietola Remolacha	Garden beet Beetroot	*Beta vulgaris* L.	Chenopodiaceae (Goosefoot)	Roots	Spring Summer Fall Winter	Cooked Canned Pickled	Leaves from young plants often used as greens. In some regions flowers are cooked as fritters.
18 Borage Bourrache officinale Borretsch Borragine Borraja	Cool-tankard Talewort	*Borago officinalis* L.	Boraginaceae (Borage)	Young leaves	Spring Fall Winter	Raw Cooked Pickled	Young leaves used in salads and also cooked as greens. Can be used in cordials. Flowers can be candied or used for garnishing salads.

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* Following the English name, the equivalent is given for French, German, Italian, and Spanish.

† Italicized seasons indicate period or periods of peak production in California (2). Some vegetables may be available in the markets during seasons other than those indicated because of shipments into the state.

‡ References for Section II are indicated by numbers in parentheses. See page 37 for list of references.

VEGETABLE DESCRIPTIONS AND NOTES—*Continued*

Name or cultivar*	Other names	Scientific name	Family	Edible portion analyzed	Season available†	Common edible form	Miscellaneous information
19 Broccoli, sprouting Chou brocoli, chou-fleur d' hiver Brockoli, Spargelkohl Cavolo broccolo Bróculi	Broccoli Italian green sprouting broccoli	*Brassica oleracea* L. var. *italica* Plenck	Cruciferae (Mustard)	Tender stems and immature floral parts	*Spring* Summer *Fall* *Winter*	Cooked Frozen	Relatively unknown in the United States 30 years ago; now one of the leading vegetables. Similar to cauliflower in flavor. Leaves can be used as greens.
20 Brussels sprouts Choux de Bruxelles Rosenkohl Cavolo di Bruxelles Col de Bruseles	"Sprouts"	*Brassica oleracea* L. var. *gemmifera* Zenker	Cruciferae (Mustard)	Developed axillary buds	*Fall* Winter Spring	Cooked Frozen	Similar to cabbage and cauliflower in flavor. Smallest and firmest sprouts have best flavor.
21 Burdock root	Edible burdock Gobo Butter-bur (5) Beggar's buttons	*Arctium lappa* L.	Compositae (Sunflower)	Root	Summer Fall Winter	Cooked	Roots should be used when plant is 2 to 3 months old. Older plants are hard and woody, have an unpleasant flavor.
22–24 Cabbage Chou Kopfkohl, Kraut Cavolo, Cappuccio Repollo		*Brassica oleracea* L. var. *capitata* L.	Cruciferae (Mustard)	Terminal buds or "heads" made up of leaves	Spring Summer Fall Winter	Raw Cooked Pickled	Green-leaved types common, but red ones also known. Edible cabbage sprouts develop after main head is removed.
25–26 CHINESE CABBAGE Chou de Chine Chinesischer Kohl Cavolo di Cina Col de Chino	Celery cabbage		Cruciferae (Mustard)				
25 Pak-choi		*Brassica chinensis* L.		Leaves and stems	Spring Summer *Fall* *Winter*	Cooked	Does not form a head. Ribs or petioles sometimes eaten like asparagus. Somewhat similar in appearance to mustard.

Pe-tsai		*Brassica pekinensis* Rupr.		Leaves and stems	Spring Summer *Fall* *Winter*	Raw Cooked Pickled	Forms a rather full, upright, compact head; milder in flavor and more tender than cabbage.
27 Cardoon Cardon Kardone, Cardy Cardo Cardo	Cardoni	*Cynara cardunculus* L.	Compositae (Sunflower)	Petioles	Late fall Winter	Cooked	Closely related to globe artichoke. Blanched stalks or ribs of inner leaves can be parboiled for soup or fried in egg batter.
28–31 Carrot Carotte Karotte, Möhre, Gelbrübe Carota Zanahoria		*Daucus carota* L. var. *sativa* DC.	Umbelliferae (Parsley)	Roots	Spring Summer Fall Winter	Raw Cooked Canned Frozen	Orange, yellow, red, and white varieties known. Root lengths vary from a few inches to 2 feet, depending on variety.
32–33 Cauliflower Chou-fleur Blumenkohl Cavolfiore Coliflor	Heading broccoli Cauliflower broccoli (refers to winter types)	*Brassica oleracea* L. var. *botrytis* L.	Cruciferae (Mustard)	Immature inflorescence "curd"	Spring Summer Fall Winter	Raw Cooked Pickled Frozen	Early and winter varieties have distinct characteristics. Early types have small plant and curd; leaves do not curl over head. Curd is usually snowy white.
34 Celeriac Céleri-rave Knollensellerie Sedanorapa Apio-nabo	Hamburg Turnip-rooted celery Celery root	*Apium graveolens* L. var. *rapaceum* DC.	Umbelliferae (Parsley)	Enlarged roots	*Fall* *Winter* Early spring	Raw Cooked	Leaves are bitter, but root tastes like a combination of celery and parsley.
35–36 Celery Céleri Sellerie Sedano Apio		*Apium graveolens* L. var. *dulce* Pers.	Umbelliferae (Parsley)	Petioles	Spring Summer Fall Winter	Raw Cooked	Present cultivars have a solid petiole; in earlier types petiole was hollow. Green varieties now more common than yellow.
37–38 Celtuce	Asparagus lettuce	*Lactuca sativa* L. var. *asparagina* Bailey	Compositae (Sunflower)	Young stems and leaves	Spring Fall	Raw Cooked	Same genus and species as lettuce. Leaves are long, narrow, and never form a head. Young leaves used as greens.

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† Italicized seasons indicate period or periods of peak production in California (2). Some vegetables may be available in the markets during seasons other than those indicated because of shipments into the state.

VEGETABLE DESCRIPTIONS AND NOTES—*Continued*

Name or cultivar*	Other names	Scientific name	Family	Edible portion analyzed	Season available†	Common edible form	Miscellaneous information
39 Chard, Swiss Poirée ou Betté Mangold, Bette Bieta Bleda	Chard White beet (5) Strawberry spinach Sea-kale beet	*Beta vulgaris* L. var. *cicla* L.	Chenopodiaceae (Goosefoot)	Young leaves	Spring Summer Fall Winter	Cooked	Same species as table beet. Leaves harvested repeatedly throughout the year.
40 Chayote	Vegetable pear Pepinella	*Sechium edule* Sw.	Cucurbitaceae (Gourd)	Fruits	Fall	Cooked	Native to tropical America. Somewhat similar to summer squash in taste. Camochayote refers to tuberous roots.
41–42 Chicory Chicorée sauvage Wilde oder bittere chicorie, Cichorienwurzel Cicoria Achicoria	Succory Endive (5)	*Cichorium intybus* L.	Compositae (Sunflower)	Leaves and small roots	Spring Fall Winter	Raw Cooked	Leaves used in salads. Dried, ground roots can be roasted and used as a substitute for coffee.
43 Chives Ciboulette, civette Schnittlauch Cipollina Cebollino	Cive	*Allium schoenoprasum* L.	Amaryllidaceae (Amaryllis)	Leaves	Spring Summer Fall Winter	Raw Frozen	Same family as onions. May be propagated from seeds or by division of plants.
44 Corn, sweet Maïs sucre Zuckermais Mais, grano turco dulce Maíz	Maize	*Zea mays* L. var. *rugosa* Bonaf.	Gramineae (Grass)	Immature kernels	Spring *Summer* Fall	Cooked Canned Frozen Dried	Only yellow varieties contain pigments that can become vitamin A.
45–46 Cucumber Concombre Gurke Cetriolo Pepino	"Cucs"	*Cucumis sativus* L.	Cucurbitaceae (Gourd)	Fruits	Spring *Summer* Fall Winter	Cooked Raw Pickled	Some fruits may contain a rather bitter principle which can be removed by salting and then pressing before seasoning.
47 Eggplant Aubergine Eierpflanze,	Aubergine Mad apple	*Solanum melongena* L. var. *esculentum* Nees.	Solanaceae (Nightshade)	Fruits	Spring *Summer* *Fall*	Cooked Pickled	Fruits from different varieties vary in shape and size; may be purple, yellow, green,

Eierfrüchte Melanzana Berenjena					Winter		or white. Names probably originated from edible ornamental cultivar with fruit resembling chicken egg.
48 Endive Chicorée endive Endivien Indivia-cicoria Endibia	Chicory (5)	*Cichorium endivia* L.	Compositae (Sunflower)	Young leaves	Spring Summer Fall Winter	Raw	Leaves can be blanched either by crowding or tying tips together. Slightly bitter taste.
49 Epos root	Squaw root Apaw	*Perideridia oregana* (S. Wats.) Mathias	Umbelliferae (Parsley)	Subterranean storage organ	Summer Fall	Raw Cooked Dried	Indians of southern Oregon and northern California use as food. Roots resemble nuts; flesh is white.
50 Escarole Escarole Eskaroil Escarola Escarola		*Cichorium endivia* L.	Compositae (Sunflower)	Leaves	Spring Summer Fall Winter	Raw	Differs from endive in that leaves are slightly crumpled and not as finely cut.
51 Fennel Fenouil Fenchel Finocchio Hinojo	Finocchio Florence fennel Sweet anise	*Foeniculum vulgare* Mill. var. *dulce* Fiori	Umbelliferae (Parsley)	Stalks, leaves	Fall Winter	Raw Cooked	Sweet licorice-like flavor. Is often used as a condiment. Seeds used in manufacture of liqueurs.
52 Garlic Ail ordinaire Gewöhnlicher Knoblauch Aglio Ajo vulgar	Clown's treacle Poor man's theriac (5)	*Allium sativum* L.	Amaryllidaceae (Amaryllis)	Bulbs (cloves)	Spring *Summer* Fall Winter	Raw Cooked Dried	Plant rarely flowers; propagated exclusively by means of cloves. Pungent principle forms only after cells are broken.
53 Gherkin	Bur cucumber Wild cucumber	*Cucumis anguria* L.	Cucurbitaceae (Gourd)	Fruits	Summer Fall	Pickled	Small cucumber fruits are incorrectly called gherkins. Gherkins have prominent spines.
54 Ginger		*Zingiber officinale* Roscoe or *Z. zerumbet* Smith	Zingiberaceae (Ginger)	Rhizomes	Fall	Raw Dried	Fresh root has a characteristic odor. Popular as a condiment or candied.

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† Italicized seasons indicate period or periods of peak production in California (2). Some vegetables may be available in the markets during seasons other than those indicated because of shipments into the state.

VEGETABLE DESCRIPTIONS AND NOTES—*Continued*

Name or cultivar*	Other names	Scientific name	Family	Edible portion analyzed	Season available†	Common edible form	Miscellaneous information
55 Horse-radish Raifort sauvage, Cran Meerrettig, Kran Rafano Teramayo		*Armoracia rusticana* Gaertn. (4) (*A. lapathifolia* Gilib.)	Cruciferae (Mustard)	Roots	Fall	Raw Dried	Vegetatively propagated. Holds its pungency for a very short time after grinding.
56 Husk-tomato Alkélkenge jaune doux Judenkirsche Alchechengi giallo Alquequenje	Ground-cherry Tomatillo	*Physalis ixocarpa* Brot.	Solanaceae (Nightshade)	Fruits	Late summer Fall	Raw Cooked	Fruit enclosed in tissue-like calyx. Combined with chili peppers for hot sauce used in Mexican or Spanish food. Also made into preserves and pie filling.
57 Ice-plant Ficoïde glaciale Eiskraut Erbaghiacciola Escarchosa	Beach apple	*Mesembryanthemum crystallinum* L.	Aizoaceae (Carpet weed)	Leaves	Spring Summer Fall Winter	Cooked	Native to southern and lower California, Greece, and Cape of Good Hope. Leaves used as greens.
58 Kale Chou vert Blätterkohl Cavolo verde Col crespa	Borecole Collards Colewort	*Brassica oleracea* L. var. *acephala* DC.	Cruciferae (Mustard)	Leaves	Fall Winter	Raw Cooked	Does not form a head. Originated in an attempt to grow cabbage under unfavorable conditions.
59 Kale, Scotch	Braschette	*Brassica oleracea* L. var. *fimbriata* Mill. (7) (*B. fimbriata* DC.)	Cruciferae (Mustard)	Leaves	Fall Winter	Raw Cooked	Varies from kale only in that its leaves are savoyed.
60 Kohlrabi Chou-rave Oberkohlrabi Cavolo rapa Col rabano		*Brassica oleracea* L. var. *gongylodes* L. (6) (*B. caulorapa* Pasq.)	Cruciferae (Mustard)	Stems	Summer Fall Winter	Cooked	Stems swollen almost to globular shape. Similar to turnips in texture and use.
61 Leek Poireau Porree, Lauch		*Allium porrum* L.	Amaryllidaceae (Amaryllis)	Blanched bases	Spring Summer Fall	Cooked	Plant may be blanched with soil to increase edible tissue. Does not bulb. Mild onion

Porro Puerro					Winter		flavor; used primarily in soups.
62–64 LETTUCE Laitue Kopfsalat, Lattich Lattuga Lechuga			Compositae (Sunflower)				Many cultivars known. Used fresh in salads; rarely cooked.
62 Butterhead	Curled lettuce	*Lactuca sativa* L. var. *crispa* L.		Leaves	Spring Summer Fall Winter	Raw	Has a loose rosette of cut, fringed, or crisped leaves.
63 Cos	Romaine	*Lactuca sativa* L. var. *longifolia* Lam. (*L. romana* Gars.)		Leaves	Spring Summer Fall Winter	Raw	Head is upright, leaves narrow, and midrib broad.
64 Crisphead	Great Lakes Head lettuce Iceberg	*Lactuca sativa* L. var. *capitata* L.		Leaves	Spring Summer Fall Winter	Raw	Has a very dense cabbage-like rosette.
65 Lotus root		*Nelumbo nucifera* Gaertn.	Nymphaeaceae (Water-lily)	Roots	Fall	Cooked	Plants grown partially submerged in water. Rootstock may be several feet long with prominent air spaces.
66–69 MELONS Melon Melone Popone Melon							
66 Cantaloupe	Muskmelon	*Cucumis melo* L. var. *reticulatus* Naud.	Cucurbitaceae (Gourd)	Fruits	Late spring *Summer* Early fall	Raw	Can be stored for only short period. True cantaloupe (*C. melo* var. *cantaloupensis*) not grown in United States.
67 Casaba		*Cucumis melo* L. var. *inodorus* Naud.	Cucurbitaceae (Gourd)	Fruits	Late summer Fall	Raw	Can be stored longer than other melons. Skin yellow, tough, and wrinkled. Flesh thick, sweet, and white.

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VEGETABLE DESCRIPTIONS AND NOTES—*Continued*

Name or cultivar*	Other names	Scientific name	Family	Edible portion analyzed	Season available†	Common edible form	Miscellaneous information
68 Honeydew		*Cucumis melo* L. var. *inodorus* Naud.	Cucurbitaceae (Gourd)	Fruits	*Summer* Early fall	Raw	Good shipping qualities. Flesh whitish and sweet. Does not keep as long as casaba.
69 Watermelon Melon d'eau, pastèque Wassermelone Cocomero Sandia		*Citrullus vulgaris* Schrad.	Cucurbitaceae (Gourd)	Fruits	Late spring *Summer* Early fall	Raw Pickled	Native to Africa, where during drought seasons it is used as source of water.
70 Mushroom Champignon comestible Schwamm Fungo prataiolo Seta		*Agaricus campestris* L. (*A. bisporus* Singer)	Agaricaceae (Mushroom)	Sporophore (stalk and cap)	Spring Summer Fall Winter	Raw Cooked Canned Dried	Edible portion of this fungus is often called a fruiting body, because it produces spores. Contains certain carbohydrates which are reportedly not assimilated by man.
71 Mustard Greens Moutarde blanche Gelber Senf Senapa bianca Mostaza	Salad mustard	*Brassica juncea* Coss.	Cruciferae (Mustard)	Leaves	Spring Summer Fall	Raw Cooked	Leaves used when quite young. Smooth- and curled-leaf varieties grown.
72 Okra Gombo Ocher Ibisco Quimbombó	Gumbo Ladies' fingers Bamia (5)	*Hibiscus esculentus* L.	Malvaceae (Mallow or cotton)	Immature fruit pods	Summer Fall	Cooked Canned Frozen	Mucilaginous pods used in soups and sauces. Ripe seeds may be parched and substituted for coffee.
73 Chinese okra	Luffa Dishcloth gourd Vegetable sponge Towel gourd	*Luffa acutangula* Roxb.	Cucurbitaceae (Gourd)	Immature fruits	Summer Fall	Cooked	Similar to okra in appearance, but does not have mucilaginous substance. Mature fruit cylindrical, ridged, dry, and papery.
74–77 Onion Oignon		*Allium cepa* L.	Amaryllidaceae	Leaves and bulbs	Spring *Summer*	Raw Cooked	Pungent principle not released until cells are broken

Zwiebel Cipolla Cebolla			(Amaryllis)		Fall Winter	Canned Dried Pickled	
78 Parsley Persil Petersilie Prezzemolo Perejil		*Petroselinum crispum* Nym.	Umbelliferae (Parsley)	Leaves	Spring Summer Fall Winter	Raw Cooked Dried	Some varieties form parsnip-like roots which are cooked as a vegetable and used for flavoring.
79 Parsnip Panais Pastinake Pastinaca Chirivía		*Pastinaca sativa* L.	Umbelliferae (Parsley)	Roots	Spring Summer *Fall* *Winter*	Cooked	Low-temperature storage increases sugar content and improves flavor.
80 Pea, edible-podded Pois sans parchemin Zuckererbsen Piselli di guscio tenero Chícharo	Sugar pea China pea	*Pisum sativum* L. var. *macrocarpon* Ser.	Leguminosae (Pea or Pulse)	Immature pods	*Spring* Summer Fall Winter	Cooked	Pods are somewhat stringy and fibrous unless harvested very young. Popular in Chinese foods.
81 Pea Pois Erbse Pisello Guisante	Shelling pea Garden pea Green pea English pea	*Pisum sativum* L.	Leguminosae (Pea or Pulse)	Immature seeds	*Spring* Summer Fall Winter	Cooked Canned Frozen Dried	Immature seeds sweet, low in starch, and optimal in quality.
82–86 Pepper Poivre Pfeffer Peperone Chile	Mango	*Capsicum annuum* L. (8) (*C. frutescens* L. var. *grossum* Bailey)	Solanaceae (Nightshade)	Fruits	Spring *Summer* *Fall* Winter	Raw Cooked Canned Pickled Dried	Some cultivars pungent (chilis). Pungent material found only on septal divisions between locules, not in fruit-wall tissue.
87–89 Potato Pomme de terre Kartoffel Patata Papa	"Spuds"	*Solanum tuberosum* L.	Solanaceae (Nightshade)	Tubers	Spring *Summer* *Fall* Winter	Cooked Canned Frozen Dried	White-, yellow- and purple-fleshed varieties known. Should be stored in dark place to prevent greening and solanine formation. Solanine is a bitter poisonous alkaloid.

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Name or cultivar*	Other names	Scientific name	Family	Edible portion analyzed	Season available†	Common edible form	Miscellaneous information
90–92 RADISH Radis Radies Ravanello Rábano			Cruciferae (Mustard)				Spring types most commonly grown in United States. Winter types much larger, ranging from 2 to 4 inches in diameter and from 5 to 20 inches long. Leaves may be boiled as greens. Seed pods may be used for pickles.
90 Chinese winter radish	Daikon	*Raphanus sativus* L. var. *longipinnatus* Bailey		Roots	Fall Winter	Raw Pickled Dried	
91 Icicle		*Raphanus sativus* L.		Roots	Spring Summer Fall Winter	Raw	
92 Scarlet Globe		*Raphanus sativus* L.		Roots	Spring Summer Fall Winter	Raw	
93 Rhubarb Rhubarbe Rhabarber Rabarbaro Ruibarbo	Pie-plant Wine-plant	*Rheum rhaponticum* L.	Polygonaceae (Buckwheat)	Leaf petioles	*Spring* Summer Fall *Winter*	Cooked Canned Frozen	Rarely grown from seed; propagated by division of crown.
94 Rutabaga Chou-navet Kohlrübe, Wrucken Cavolo navone Colínabo	Swedish turnip Turnip-rooted cabbage	*Brassica napus* L. var. *napobrassica* Mill. (6) (*B. napobrassica* Mill.)	Cruciferae (Mustard)	Roots	Winter Spring	Cooked	Yellow- and white-fleshed varities available. Best when harvested before full maturity.
95 Salsify Salsifis Haferwurzel	Vegetable-oyster Oyster-plant	*Tragopogon porrifolius* L.	Compositae (Sunflower)	Roots	Late fall Winter	Cooked	Roots have an oyster-like flavor. Leaves used in salads.

Salsifí							
96–97 Sea-kale Chou marin Meerkohl, Seekohl Cavolo marino Soldancia maritima		*Crambe maritima* L.	Cruciferae (Mustard)	Leaves	Spring	Cooked	Only a few varieties in cultivation. Blanched stalks eaten boiled; cabbage-like flavor.
98 Sorrel Oseille Sauerampfer Acetosa Acedera	Dock Sour grass	*Rumex acetosa* L.	Polygonaceae (Buckwheat)	Leaves	Early spring	Cooked	Modified little by cultivation; consists mostly of wild plants growing under favorable conditions. Leaves somewhat bitter and sour.
99 Spinach Épinard Spinat Spinaci Espináca		*Spinacia oleracea* L.	Chenopodiaceae (Goosefoot)	Leaves	Spring Summer Fall Winter	Raw Cooked Canned Frozen	Leaves contain relatively large quantities of oxalates.
100 Spinach, New Zealand Tétragone cornue Neuseeländischer Spinat Spinaci della Nuova Zelanda Espinaca de Nueva Zealandia		*Tetragonia expansa* Murr.	Aizoaceae (Carpetweed)	Leaves	Spring Summer Fall	Cooked	Leaves eaten boiled and minced like ordinary spinach. With heavy cutting, produces over 100 tons per acre. Grows wild along California coastline.
101–106 SQUASH, SUMMER Courge Kürbis Zucca Spizapallo			Cucurbitaceae (Gourd)				Most commonly grown *Cucurbitas* used in immature stage as summer squash. Best quality harvested when immature. May be held for short periods of time.
101 Crookneck		*Cucurbita pepo* L. var. *melopepo* Alef.		Immature fruits	*Spring* *Summer* Fall Winter	Cooked Canned Frozen	Fruits curved at neck, with moderately warted, orange-yellow skin.

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102 Early Prolific	Straight neck	*Cucurbita pepo* L. var. *melopepo* Alef.		Immature fruits	*Spring* *Summer* Fall Winter	Cooked Canned Frozen	Fruits slightly tapered; smooth, lemon-yellow skin. Plants very prolific.
103 Scallop	Bush scallop	*Cucurbita pepo* L. var. *melopepo* Alef.		Immature fruits	*Spring* *Summer* Fall Winter	Cooked Canned Frozen	Fruits pie- or patty-shaped with scalloped edges and smooth skin. Pale green when immature, changing to white with maturity.
104 Zucchini	Italian squash Italian marrows	*Cucurbita pepo* L. var. *melopepo* Alef.		Immature fruits	*Spring* Summer Fall Winter	Cooked Canned Frozen	Fruits smooth, cylindrical, and dark green. Small, immature fruits have best quality. Plants bear for a long time if fruits are picked.
105 Balsam-pear	Bitter gourd Balsam-apple Kuo-kwa	*Momordica charantia* L.		Young fruits	Summer Fall	Cooked	Fruit wall bitter, though flesh surrounding seeds is sweet; entire fruit is edible. At maturity, wart-like surface turns orange-yellow and bursts, exposing reddish seed coat.
106 Chinese squash	Mo-kwa	*Benincasa hispida* Cogn.		Immature fruits	Summer Fall	Cooked	Unripe fruit, similar to cucumber, used in curries. Fruit covered with bristle-like hairs.
107–111 SQUASH, WINTER, AND PUMPKIN Potiron Melone Kürbis Zucca Zapallo			Cucurbitaceae (Gourd)				Mature fruits harvested; can be stored for long periods.
107 Table Queen	Acorn	*Cucurbita pepo* L.		Mature fruits	*Spring* Summer *Fall* Winter	Cooked	Fruits small and acorn shaped, with dark-green, smooth skin, and light-yellow flesh.

108 Pink banana		*Cucurbita maxima* Duchesne		Mature fruits	Spring Summer *Fall* Winter	Cooked Canned	Fruits large, with fine-grained and mild-flavored flesh.
109 Butternut		*Cucurbita moschata* Duchesne		Mature fruits	Spring Summer *Fall* Winter	Cooked	Fruits small, with small seed cavity. Skin light creamy-brown; flesh yellow and fine grained.
110 Hubbard		*Cucurbita maxima* Duchesne		Mature fruits	Spring Summer *Fall* Winter	Cooked Canned	Fruits large, with fine-grained and mild-flavored flesh.
111 Chinese winter-melon	Wax gourd White gourd White pumpkin Ton-kwa Doong gwah	*Benincasa hispida* Cogn.		Mature fruits	*Fall* Winter	Cooked	White waxy bloom of fruit grows in sufficient quantities to make candles.
112–114 Sweet-potato Patate douce Batate Patata dolce Batata		*Ipomoea batatas* Lem.	Convolvulaceae (Morning-glory)	Roots	Spring Summer *Fall* Winter	Cooked Canned Frozen	Both moist and dry types grown. Moist types incorrectly called "yams." Immediately following harvest, roots are high in starch; after curing and during storage, some conversion of starch to sugar occurs. Leaves are used for greens in some regions.
115–116 Taro	Dasheen Elephants ear	*Colocasia esculenta* Schott.	Araceae (Arum)	Corms	Fall	Cooked	Used mostly in tropics and subtropics. Petioles also edible.
117–118 Tomato Tomate Tomate Pomodoro Tomate	Love apple	*Lycopersicon esculentum* Mill. var. *commune* Bailey	Solanaceae (Nightshade)	Fruits	Spring *Summer* *Fall* Winter	Raw Cooked Canned	Red, pink, and yellow varieties grown. Red color due to lycopene, which has no vitamin A value.

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VEGETABLE DESCRIPTION AND NOTES—*Concluded*

Name of cultivar*	Other names	Scientific name	Family	Edible portion analyzed	Season available†	Common edible form	Miscellaneous information
119–121 Turnip Navet Herbstrübe Rapa di foraggio Nabo		*Brassica campestris* L. subsp. *rapifera* Metz. Sinsh. (6, 7) (*B. rapa* L.)	Cruciferae (Mustard)	Roots	*Spring* Summer Fall *Winter*	Raw Cooked	Leaves used as greens. Both white- and yellow-fleshed varieties available. Rappini are young turnip plants.
122 Water-chestnut Macre Wassernuss Castagna d'acqua Nueis	Matai	*Eleocharis dulcis* Trin.	Cyperaceae (Sedge)	Corms	Fall Winter	Cooked Canned	Used in Oriental-type dishes. Like paddy rice, grown in flooded fields.
123 Water-convolvulus		*Ipomoea aquatica* Forsk.	Convolvulaceae (Morning-glory)	Leaves, stems	Spring Summer	Cooked	Mainly grown in the Orient. Closely related to sweet potato. Leaves used as greens.
124 Water-cress Cresson Gartenkresse Agretto Berro de aqua	Cress	*Nasturtium officinale* R. Br.	Cruciferae (Mustard)	Leaves, stems	Spring Summer Fall Winter	Raw Cooked	Edible portions used as greens and in salads. Mustard-like or pungent flavor.
125 Wonderberry Morelle noire Nachtschattenspinat Erba mora Yerba mora	Black-berried nightshade Morelle Garden huckleberry Sunberry	*Solanum nigrum* L.	Solanaceae (Nightshade)	Mature fruits	Summer Fall	Cooked	Leaves also eaten, but unripe fruits and young leaves may be poisonous.
126 Yam Igname de la Chine Wermuth Dioscorea Ñame, Igname	Chinese yam Cinnamon-vine Guiana arrowroot	*Dioscorea batatas* Dcne.	Dioscoreaceae (Yam)	Tubers	Fall Winter	Raw Cooked	Tubers eaten like potatoes—boiled, fried, and prepared in various ways. Some species produce small aerial tubers, which produce new plants.

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REFERENCES FOR SECTION II

VEGETABLE DESCRIPTIONS AND NOTES

1. Bailey, L. H.
   1949. Manual of cultivated plants. Rev. ed. The Macmillan Co., New York. 1116 p.
2. Federal-State Market News
   1960. Unloads of fresh fruits and vegetables, San Francisco-Oakland. 39 p.
   1960. Unloads of fresh fruits and vegetables, Los Angeles. 29 p.
3. Hedrick, U. P.
   1919. Sturtevant's notes on edible plants; twenty-seventh annual report. Vol. **2**, Part II. New York Agr. Expt. Sta. 686 p.
4. Lawrence, G. H. M.
   1953. Correct name of the horse-radish. Baileya **1**(1) :11.
5. Montagné, Prosper
   1961. Larousse gastronomique. The encyclopedia of food, wine, and cookery. Crown Publishers, Inc., New York. 1101 p.
6. Musil, Albina F.
   1948. Distinguishing the species of *Brassica* by their seed. U. S. Dept. Agr. Misc. Publ. 643. 35 p.
7. Olsson, G.
   1954. Crosses within the *campestris* group of the genus *Brassica.* Hereditas **40**:398–418.
8. Smith, Paul G., and C. B. Heiser, Jr.
   1951. Taxonomic and genetic studies on the cultivated peppers, *Capsicum annuum* L. and *C. frutescens* L. Am. J. Botany **38**:362–368.
9. Van Eseltine, G. P.
   1931. The vegetables of New York; annual report for year ending June 30, 1931. Vol. **1**, Part II: Beans. New York Agr. Expt. Sta. Compiled by U. P. Hedrick. 110 p.

SECTION III.

BIBLIOGRAPHY OF FOOD VALUE ANALYSES

BIBLIOGRAPHY OF FOOD VALUE ANALYSIS

AUSTRALIA

Marstan, H. E., and Mary C. Dawborn
1944. Food composition tables. Austral. Council Sci. and Indus. Res. Bull. 178, 104 p.

CANADA

Nutrition Division, Department of National Health and Welfare
1951. Table of food values recommended for use in Canada. Ottawa, Canada. 286 p.

CEYLON

Joachim, A. R. W., and D. G. Panditteseker
1943. The analysis of Ceylon foodstuffs. I. The composition of some minor fruits, home-pounded grains, and vegetables. II. The change in the vitamin C content of lime juice preserved with spirits. Tropical Agriculturist (Ceylon) 99:13–17.

CHINA

Harris, R. S., F. K. C. Wang, Y. H. Wu, C. S. Tsao, and L. Y. S. Loe
1949. The composition of Chinese foods. Am. Dietetic Assoc. J. 25:28–38.

Porterfield, W. M., Jr.
1951. The principal Chinese vegetable foods and food plants of Chinatown markets. Econ. Botany 5(1):3–37.

COLOMBIA

Gongora y Lopez, J., and N. Y. Lopez
1953. Tabla de composicion de alimentos Colombianos. Instituto Nacional de Nutrition, Republica de Colombia, Bogota, Colombia. 79 p.

COSTA RICA

Munsell, H. E., L. O. Williams, L. P. Guild, L. T. Kelley, A. M. McNally, and R. S. Harris
1950. Composition of food plants of Central America. VI. Costa Rica. Food Res. 15:379–404.

Sancho, Francisco F.
1941. Composicion quimica de los mas populares alimentos de Costa Rica. Rev. de Agr. (San Jose) 13:467–480, 515–519.

CUBA

Navia, J. M., H. Lopez, M. Cimadevilla, E. Fernandez, A. Valiente, I. D. Clement, and R. S. Harris
1955. Nutrient composition of Cuban foods. I. Foods of vegetable origin. Food Res. 20:97–113.

Navia, J. M., H. Lopez, M. Cimadevilla, E. Fernandez, A. Valiente, I. D. Clement, and R. S. Harris
1957. Nutrient composition of Cuban foods. II. Foods of vegetable origin. Food Res. 22(2):131–144.

ECUADOR

Munsell, H. E., R. Castillo, C. Zurita, and J. M. Portilla
1953. Production, uses, and composition of foods of plant origin from Ecuador. Food Res. 18:319–342.

EL SALVADOR

Munsell, H. E., L. O. Williams, L. P. Guild, C. B. Troescher, G. Nightingale, L. T. Kelley, and R. S. Harris
1950. Composition of food plants of Central America. IV. El Salvador. Food Res. 15:263–296.

GUATEMALA

Munsell, H. E., L. O. Williams, L. P. Guild, C. B. Troescher, G. Nightingale, and R. S. Harris
1950. Composition of food plants of Central America. II. Guatemala. Food Res. **15**:16–33.

Munsell, H. E., L. O. Williams, L. P. Guild, C. B. Troescher, G. Nightingale, and R. S. Harris
1950. Composition of food plants of Central America. III. Guatemala. Food Res. **15**:34–52.

Munsell, H. E., L. O. Williams, L. P. Guild, C. B. Troescher, G. Nightingale, L. T. Kelley, A. M. McNally, and R. S. Harris
1950. Composition of food plants of Central America. VIII. Guatemala. Food Res. **15**:439–453.

HAWAII

Chung, H. L., and J. C. Ripperton
1929. Utilization and composition of Oriental vegetables in Hawaii. Hawaii Agr. Expt. Sta. Bull. **60**, 64 p.

Miller, Carey D., W. Ross, and L. Louis
1947. Hawaiian grown vegetables—proximate composition. Hawaii Agr. Expt. Sta. Tech. Bull. **5**, 45 p.

HONDURAS

Munsell, H. E., L. O. Williams, L. P. Guild, C. B. Troescher, G. Nightingale, and R. S. Harris
1949. Composition of food plants of Central America. I. Honduras. Food Res **14**:144–164.

Munsell, H. E., L. O. Williams, L. P. Guild, C. B. Troescher, G. Nightingale, L. T. Kelley, and R. S. Harris
1950. Composition of food plants of Central America. VII. Honduras. Food Res. **15**:421–438.

INDIA

Aykroyd, W. R., V. N. Patwardhan, and S. Ranganathan
1956. The nutritive value of Indian foods and the planning of satisfactory diets. Health Bull. **23**. 5th ed. Nutrition Research Laboratories, Government of India Press, Delhi, India. 77 p.

Kantha, J., M. Narayana Rao, M. Swaminathan, A. H. Sankaran, and V. Subrahrnanyan
1957. Nutritive value of Indian multipurpose foods. Food Sci. **6**:80–83.

ITALY

Chatfield, Charlotte
1954. Food composition tables—minerals and vitamins. Food and Agriculture Organization Nutritional Studies **11**. F.A.O. of the United Nations, Rome, Italy. 117 p.

JAPAN

Tadasu, S., T. Higuchi, M. Kondo, and K. Matsuzawa
1934. The chemical analysis of food in Japan. 3rd ed. enlarged. Nankodo & Co., Ltd., Tokyo, Kioto. 353 p.

MEXICO

Cravito, B. R., E. E. Lockhart, R. K. Anderson, F. De P. Miranda, and R. S. Harris
1945. Composition of typical Mexican foods. J. Nutr. **29**:317–329.

Cravioto, R. O.
1951. Valor nutritivo de los alimentos Mexicanos. Ciencia **11**:9–17.

Cravioto, R. O., Guillermo Massieu H., Jesus Gusman G., and Jose Calvo De La Torre
1951. Composicion de alimentos Mexicanos. Ciencia **11**:129–155.

Massieu H., Guillermo, Jesus Gusman G., R. O. Cravioto, and Jose Calvo De La Torre
1951. Nutritive value of some primitive Mexican foods. Am. Dietetic Assoc. J. **27**:212–214.

NICARAGUA

MUNSELL, H. E., L. O. WILLIAMS, L. P. GUILD, C. B. TROESCHER, AND R. S. HARRIS
1950. Composition of food plants of Central America. V. Nicaragua. Food Res. 15:355–365.

PHILIPPINES

ADRIANO, F. F., AND M. S. DE GUZMAN
1932. Proximate chemical analysis of some Philippine food products. Philip. Agr. 20:530–534, 580–592.

INTEN, C. L.
1956. Composition of Philippine foods. V. Philippine J. Sci. 85:203–213.

TAIWAN

HUANG, CHI-LIEN, YUEH-HENG YANG, AND J. H. MACGILLIVRAY
1957. Nutrient value of Taiwan crops in production and consumption. Rept. of Chinese-American Joint Commission on Rural Reconstruction, Taipei, Taiwan, Free China. 20 p.

TROPICAL COUNTRIES

PLATT, B. S.
1945. Tables of representative values of foods commonly used in tropical countries. G. Brit. Med. Res. Council Spec. Rept. Ser. 253, 41 p. London.

UNITED STATES

ANDREWS, J. C., AND E. T. VISER
1951. The oxalic acid content of some common foods. Food Res. 16:306–312.

BOWES, A. DE P., AND C. F. CHURCH
1956. Food values of portions commonly used. 8th ed. College Offset Press, Philadelphia, Pa. 110 p.

BRADLEY, A. V.
1956. Tables of food values. Rev. and enlarg. C. A. Bennett Co., Peoria, Ill. 232 p.

CHATFIELD, CHARLOTTE
1949. Food composition tables. Food and Agriculture Organization Nutritional Studies 3. F.A.O. of the United Nations, Washington, D.C. 56 p.

CHRISTENSEN, R. P.
1948. Efficient use of food resources in the United States. U. S. Dept. Agr. Tech. Bull. 963, 98 p.

CLARK, F., B. FRIEND, AND M. C. BURK
1947. Nutritive value of the per capita food supply. 1909–1945. U. S. Dept. Agr. Misc. Publ. 616, 36 p.

FITZGERALD, G. A., AND C. R. FELLER
1938. Carotene and ascorbic acid content of fresh market and commercially frozen fruits and vegetables. Food Res. 3:109–120.

FRENCH, R. B., AND O. D. ABBOTT
1948. Levels of carotene and ascorbic acid in Florida-grown foods. Florida Agr. Expt. Sta. Bull. 444, 21 p.

FRENCH, R. B., O. D. ABBOTT, AND R. O. TOWNSEND
1951. Levels of thiamine, riboflavin, and niacin in Florida-produced foods. Florida Agr. Expt. Sta. Bull. 482, 19 p.

HOWARD, F. D., A. H. BOCKIAN, B. HALL, AND J. H. MACGILLIVRAY
1953. Chili pepper food value. Mimeo Laboratory Report. Vegetable Crops Dept., Univ. of California, Davis. 2 p.

JANES, B. E.
1949. Composition of Florida-grown vegetables. Florida Agr. Expt. Sta. Tech. Bull. 455, 44 p.

JANES, B. E.
1951. Composition of Florida-grown vegetables. III. Effects of location, season, fertilizer level, and soil moisture on the mineral composition of cabbage, beans, collards, broccoli, and carrots. Florida Agr. Expt. Sta. Bull. 488, 32 p.

MacGillivray, J. H.
1945. Short and long food chains among vegetable crops. Science **102**:533–535.

MacGillivray, J. H., J. W. Perdue, and M. Yamaguchi
1952. Food value of some minor California vegetable crops. Truck Crops Mimeo. **53**. Vegetable Crops Dept., Univ. of California, Davis. 11 p.

MacGillivray, J. H., A. Shultis, G. C. Hanna, and A. F. Morgan
1944. Food values on a pound, acre, man-hour basis for California fresh vegetables. California Agr. Expt. Sta. Proc., 23 p.

Maynard, L. A., and W. L. Nelson
1948. Foods of plant origin. Am. Med. Assoc. J. **136**:1043–1048.

McCance, R. A., and E. M. Widdowson
1946. The chemical composition of foods. G. Brit. Med. Res. Council Spec. Rept. Ser. **235**, p. 156.

Orri, M. L., and B. K. Watt
1957. Amino acid content of foods. Home Econ. Res. Rept. **4**, U. S. Dept. Agr., 82 p.

Sherman, H. C.
1944. Principles of nutrition and nutritive value of food. U. S. Dept. Agr. Misc. Publ. **546**, 40 p.

Sims, G. T., and G. M. Volk
1947. Composition of Florida-grown vegetables. I. Mineral composition of commercially grown vegetables in Florida as affected by treatment, soil type, and locality. Florida Agr. Expt. Sta. Bull. **438**, 31 p.

Somers, G. F., and K. C. Beeson
1948. Influence of climate and fertilizer practices upon the vitamin and mineral content of vegetables. Advances in Food Res. **1**:291–324.

Van Derlinden, L.
1948. Complete food analyses. New Agr. **31**(3):9–10.

Watt, B. K., and A. L. Merrill
1950. Composition of foods—raw, processed, prepared. U. S. Dept. Agr., Agr. Handb. **8**, 147 p.

Yamaguchi, M., and J. H. MacGillivray
1955. Nutritive values of California-grown green and white asparagus. Veg. Crops Ser. **77**, 3 p.

Yamaguchi, M., J. H. MacGillivray, F. D. Howard, M. Simone, and C. Sterling
1954. Nutrient composition of fresh and frozen lima beans in relation to variety and maturity. Food Res. **19**:617–626.

Yamaguchi, M., J. W. Perdue, and J. H. MacGillivray
1960. Nutrient composition of White Rose potatoes during growth and after storage. Am. Potato J. **37**(2):73–76.

Yamaguchi, M., B. Robinson, and J. H. MacGillivray
1952. Some horticultural aspects of the food value of carrots. Am. Soc. Hort. Sci. Proc. **60**:351–359.

VENEZUELA

Jaffe, W. G., B. Nolberga, C. Embden, S. Garcia, H. Olivares, and M. Gross
1956. Composicion de pecados Venzolanos. Arch. Venzolanos de Nutr. **7**:163–166.

SEE ALSO:

Food Research
Journal of Home Economics
Nutrition Abstracts and Reviews
Nutritive Value of Foods, Home and Garden Bulletin **72**. U. S. Dept. Agr. 30 p. 1960.
Tables of food composition in terms of eleven elements. U. S. Dept. Agr. Publ. **572**, 30 p. 1945.
The Journal of Nutrition
The Journal of the American Medical Association
The Journal of the American Dietetic Association
U. S. Department of Agriculture Handbook **8**. 147 p. 1950.
U. S. Department of Agriculture Handbook **34**. 62 p. 1952.
U. S. Department of Agriculture Miscellaneous Publication **664**. 28 p. 1948.

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